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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,514	01/27/2004	Tadahiro Okazaki	KAW 112	9961
23995	7590	06/30/2005	EXAMINER	
RABIN & Berdo, PC 1101 14TH STREET, NW SUITE 500 WASHINGTON, DC 20005			MONDT, JOHANNES P	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/764,514

Applicant(s)

OKAZAKI, TADAHIRO

Examiner

Johannes P. Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/27/04 (Filing).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 6-11 is/are rejected.
- 7) ☒ Claim(s) 3-5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/27/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the filing of the Application on 1/27/2004.

Information Disclosure Statement

The examiner has considered the item listed on the Information Disclosure Statement filed 1/27/2004. A signed copy of Form PTO-1449 is enclosed with this action.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. ***Claims 1-2*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jüstel, et al (6,084,250) in view of Sugawara et al (US 2002/0030197 A1). Jüstel et al teach a semiconductor light emitting device comprising: an ultraviolet ray light emitting element (abstract); a blue color converting light emitting fluorescent material excited by ultraviolet rays and emitting blue light (cf. abstract), a green color converting layer containing a green color light emitting fluorescent material excited by ultraviolet rays and emitting green light (cf. abstract), and a red color converting light emitting fluorescent material excited by ultraviolet rays and emitting red light (cf., abstract). Jüstel et al do not necessarily teach the limitation as claimed of a layering of the blue color converting light-emitting material, the green color converting light-emitting material, and the red color converting light-emitting material stacked in this order on the ultraviolet ray light emitting element in this order. However, it would have been obvious

to include said limitation in view of Sugawara et al, who, in a patent application drawn to a white light emitting diode (see "Background of the Invention"), teach the layering of the green color converting light-emitting material and red color light emitting material in this order over the blue color light emitting material (see "Third Embodiment"; paragraphs [0079]-[0096]) so as to arrive at a standardized method of mass manufacturing in which variation between devices is minimized ([0086]). *Motivation* to include the teaching by Sugawara et al in the invention by Jüstel at least derives from said minimization of device variation in the manufacturing process.

On claim 2: according to the invention by Jüstel et al viable selections for the phosphors include (see Table 1 in col. 4) BaMgAl₁₀:Eu for blue, BaMgAl₁₀Eu:Mn for green and Eu(diketonate)_xb₁x_{b2} where X is a pyridine or mono-dentate pyridine derivative (see col. 3, l. 51-col. 4, l. 5), which meets the claim as the addition of Mn increases the particle size from blue to green, while the red phosphor is larger in molecular size than the green phosphor. Hence the ordering and consequent range of particle size of the red and green phosphors given the blue phosphor particle size as claimed is found in the prior art. Furthermore, Applicant is reminded that a *prima facie* case of obviousness typically exists when the ranges as claimed overlap the ranges disclosed in the prior art or when the ranges as claimed do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. In re Peterson, 65 USPQ2d 1379 (CA FC 2003).

3. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Jüstel et al and Sugawara et al as applied to claim 1 above, and further in view of Nakamura et al

(6,469,323 B1). As detailed above, claim 1 is unpatentable over Jüstel et al in view of Sugawara et al, neither necessarily teaching the further limitation as defined by claim 6: the range of the emission peak in Jüstel et al is instead from 300 nm to 370 nm (abstract). However, as shown by Nakamura et al GaN-based light-emitting devices with a primary emission peak of 400 nm can be achieved by doping an InGaN light-emitting layer with p-type impurities, thus increasing the blue light content of the primary emission (col. 7, l. 31-35 and col. 8, l. 28-37 and Figure 4). *Motivation* to include the teaching by Nakamura et al in the invention by Jüstel et al at least derives from the increased availability of light in the portion of the spectrum that contributes to the desired white light, namely an increase in the blue light content of the primary emission spectrum.

4. **Claims 7 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jüstel et al and Sugawara et al in view of Höhn et al (6,245,259 B1). Jüstel et al teach a semiconductor light emitting device comprising: an ultraviolet ray light emitting element (abstract); a blue color converting light emitting fluorescent material excited by ultraviolet rays and emitting blue light (cf. abstract), a green color converting layer containing a green color light emitting fluorescent material excited by ultraviolet rays and emitting green light (cf. abstract), and a red color converting light emitting fluorescent material excited by ultraviolet rays and emitting red light (cf., abstract). *Jüstel et al do not necessarily teach* the limitation as claimed of a layering of the blue color converting light-emitting material, the green color converting light-emitting material, and the red color converting light-emitting material stacked in this order on the

ultraviolet ray light emitting element in this order. *However, it would have been obvious* to include said limitation in view of Sugawara et al, who, in a patent application drawn to a white light emitting diode (see "Background of the Invention"), teach the layering of the green color converting light-emitting material and red color light emitting material in this order over the blue color light emitting material (see "Third Embodiment"; paragraphs [0079]-[0096]) so as to arrive at a standardized method of mass manufacturing in which variation between devices is minimized ([0086]). *Motivation* to include the teaching by Sugawara et al in the invention by Justel at least derives from said minimization of device variation in the manufacturing process. Neither Justel et al nor Sugawara et al necessarily teach the limitation of a substrate with a pair of terminal electrodes placed on both ends of the substrate, with two electrodes of the ultraviolet light emitting element electrically connected to the pair of terminal electrodes, although a substrate is inherent to an UV diode. However, it would have been obvious to include said limitation in view of Höhn et al, who teach a pair of terminal electrodes 2 and 14/3 (col. 8, l. 10-11 and col. 8, l. 46: Figures 1-2: N.B.: bond wire is attached to the substrate and is a terminal through its connexion with terminal 3) placed on both ends of a substrate 1 (col. 8, l. 3-10) with two electrodes 11 and 12 (col. 8, l. 3-12) of the ultraviolet ray light emitting element being electrically connected to the pair of terminal electrodes. *Motivation* to include the teaching by Höhn et al in the invention by Justel et al at least derives from the electrical contact, necessary for the operation of the light-emitting diode, that is firmly secured by the teaching by Höhn et al in accordance to methods known well in the art.

On claim 8: although Jüstel et al and Sugawara et al do not teach the further limitation defined by this claim it would have been obvious to include said further limitation in view of the embodiment according to Figure 4 by Höhn et al wherein the terminal electrodes are also placed on both ends of a substrate ((right-hand and left-hand side ends) and the two electrodes of the UV light emitting element are also connected to said pair of terminal electrodes (see Figure 4), but wherein a reflection case 16 is further comprised so as to surround the UV light emitting element (col. 8, l. 66 – col. 9, l. 14). *Motivation* at least derives from the advantage implied by said reflection case to recapture light gone astray.

5. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Jüstel et al and Sugawara et al in view of Höhn et al (6,245,259 B1). Jüstel et al teach a semiconductor light emitting device comprising: an ultraviolet ray light emitting element (abstract); a blue color converting light emitting fluorescent material excited by ultraviolet rays and emitting blue light (cf. abstract), a green color converting layer containing a green color light emitting fluorescent material excited by ultraviolet rays and emitting green light (cf. abstract), and a red color converting light emitting fluorescent material excited by ultraviolet rays and emitting red light (cf., abstract). *Jüstel et al do not necessarily teach* the limitation, as claimed, of a layering of the blue color converting light-emitting material, the green color converting light-emitting material, and the red color converting light-emitting material stacked in this order on the ultraviolet ray light emitting element in this order. *However, it would have been obvious* to include said limitation in view of Sugawara et al, who, in a patent application drawn to

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a white light emitting diode (see "Background of the Invention"), teach the layering of the green color converting light-emitting material and red color light emitting material in this order over the blue color light emitting material (see "Third Embodiment"; paragraphs [0079]-[0096]) so as to arrive at a standardized method of mass manufacturing in which variation between devices is minimized ([0086]). *Motivation* to include the teaching by Sugawara et al in the invention by Jüstel at least derives from said minimization of device variation in the manufacturing process.

Neither Justel et al nor Sugawara et al necessarily teach the limitation of a pair of leads with the UV light-emitting diode placed on a bottom face of a recessed portion on an upper end face of one of the paired leads, with a pair of electrodes thereof electrically connected to the paired leads. *However, it would have been obvious* to include said limitation in view of Höhn et al, who teach a pair of leads 2 and 3; a UV light emitting element placed on a bottom face (portion 16) of a recessed section formed on an upper end face of one of the paired leads (namely: 2), with a pair of electrodes thereof being electrically connected to the paired leads (bond wires 14 are attached to the paired leads 2 and 3 and form electrodes of the UV diode), a so-called radial diode. *Motivation* to include the teaching by Höhn et al in the invention by Jüstel et al at least derives from the radial diode's advantage as containing a reflector 16 reflecting light otherwise being astray (col. 8, l. 66 – col. 9, l. 8).

6. **Claims 10 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jüstel et al, Sugawara et al and Höhn et al as applied to claim 9 above, and further in view of Sugimoto (JP 60012782 A). As detailed above, claim 9 is unpatentable over

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Justel et al in view of Sugawara et al and Hohn et al, none, however, teaching the further limitations of claims 10 and 11. However, with regard to claim 10, combination of the teaching by Hohn et al with the invention by Justel et al and Sugiware et al places the color converting layers inside the recessed portion because the area immediately above the UV light emitting diode as used by Sugiware et al for this purpose is inside said recessed portion (see Figure 4). *Furthermore, it would have been obvious to include the limitation as claimed on tip portions of the paired leads as claimed in view of Sugimoto et al*, who teach mounting a light emitting diode of an LED chip 5 comprising the sealing of not only the chip and connection 7 but also said tip portions with a transparent resin 14 (see English abstract). *Motivation* at least stems from the comprehensive sealing of the device without loss of light, by virtue of the use of the transparent resin.

With regard to claim 11, while combination of the teaching by Hohn et al with the invention by Justel et al and Sugiware et al leads to the blue color, green color, and red color converting layers to be formed on a periphery of the sealing member, namely tight above the light emitting diode, *while it would have been obvious* to include the limitation on tip portions of the paired leads sealed with a sealing member made of a light transmitting resin in view of Sugimoto et al who teach mounting a light emitting diode of an LED chip 5 comprising the sealing of not only the chip and connection 7 but also said tip portions with a transparent resin 14 (see English abstract). *Motivation* at least stems from the comprehensive sealing of the device without loss of light, by virtue of the use of the transparent resin.

Allowable Subject Matter

7. Claims 3-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Within the context of the invention as defined by claim 1, neither the average particle size of the red color light emitting fluorescent material nor that of the green color light emitting fluorescent material have been found in the art, sizes being substantially distanced from the claimed ranges.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM

June 23, 2005

Patent Examiner:

A handwritten signature in black ink, appearing to read 'J. Mondt', with a stylized flourish at the end.

Johannes Mondt (Art Unit: 2826).